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HAZWRAP

HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM

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THIS TRANSMITTAL CONSISTS OF 6 PAGES (EXCLUDING COVER SHEET)

COMMENTS:

Document Review: Draft Plutonium in Soils Treatability Studies Work Plans: TRUclean Process and Magnetic Separation, RFP, OU 2, Volumes I and II, Nov. 14, 1991 - Reference Number H920078.

Date: December 12, 1991

DOCUMENT REVIEW: DRAFT PLUTONIUM IN SOILS
TREATABILITY STUDIES WORK PLANS:
TRUclean PROCESS AND MAGNETIC SEPARATION
ROCKY FLATS PLANT, OPERABLE UNIT 2
VOLUMES I AND II, NOVEMBER 14, 1991

GENERAL COMMENTS:

1. The goals of the sampling plan methodology are somewhat unclear. The Field Sampling Plan (FSP) and the Field Sampling Procedure for Sampling Plutonium (Pu)-Contaminated Soils to Support Treatability Tests (Attachment 1) are presented separately and indicate that all precautions will be made to collect random soil samples. It appears, from information contained in the FSP and Attachment 1, that these random soil samples will comprise a single bulk sample, that will be divided and shipped to Los Alamos National Laboratory (LANL), Nevada Test Site (NTS), and one will remain at Rocky Flats Plant (RFP). Section 3 (Site Characterization and Data for Soils), however, indicates that distinction between soil types and levels of Pu concentration for each sample are of significance to the success of the project. For example, it is noted that for each of the two soil types each will have a high and low Pu concentration. Why is the emphasis placed on soil type, and the distinction between Pu concentration levels, when the sampling plan indicates that all the samples will be mixed into a bulk sample should be explained.

2. Prior to the development of the electron microprobe, the two technologies discussed in the Work Plan (WP) were commonly used to separate minerals in crushed rock samples so that individual minerals could be analyzed by "wet-chemical" techniques. The two techniques were commonly used together because specific minerals were most effectively separated on the basis of density contrasts, whereas other minerals were most effectively separated because of their paramagnetic or diamagnetic properties. Because the total Pu, the alpha emitters, and the beta emitters will be absorbed onto the surfaces of a variety of minerals and organic constituents (e.g., clay minerals, hydrous iron oxides, carbonates, humic acids, etc.), optimum remediation of the soil may be affected by combining the two processes (instead of trying the processes independently).

3. It is possible that neither technology will successfully reduce concentrations of gross beta, gross alpha, and total Pu to concentrations that satisfy the designated remediation levels. If alternative remedial actions and/or treatability strategies were discussed in the Final Treatability Studies Plan (TSP - DOE, 1991), what these alternatives include should be explained in the Executive Summary or the Introduction.

4. The FSP and Attachment 1 should be combined into a single FSP for enhanced clarity.

5. A table of the equipment and the variable parameters (including the tentative operating range) would be quite helpful to summarize the information.

DRAFT

SPECIFIC COMMENTS:

1. Executive Summary, p. i, first paragraph: It is stated that the TRUclean Process and Magnetic Separation Processes were selected during development of the Final Treatability Studies Plan (TSP - DOE, 1991), however, the FSP indicates that "other potential treatments for removing Pu/americium in soils" (Sect. 1.0, p. 3, second paragraph) will be performed at the NTS. These other "potential treatments" should be mentioned in the Executive Summary and/or the Introduction. It should also be noted whether or not the implementation of these alternative treatability tests will require the writing of a new WP appropriate for the specific treatability process.

2. Executive Summary, p. i, second paragraph: Attachment 4 is not included in the WP.

   Where "soils with concentrated contaminants" will be stored off-site should be clarified. Also, whether the states of Nevada and New Mexico are willing to except radioactive waste from RFP should be discussed.

3. Figure ES-1, p. iii: The fate of the waste soils containing concentrated Pu, as a result of the treatability projects, should be specified on Figure ES-1.

3. Acronyms, p. iv: The term "ERP" should be included in the acronym list.

4. Section 1.2, Previous Related Work, p. 2, second paragraph: It is stated that application of the TRUclean process to Rocky Flats Pu contaminated samples, resulted in concentrations approaching the proposed remediation goals. Although Attachment 4 is supposed to contain the results of the AWC (1987) Study, these results should be briefly summarized in this section. It would be particularly interesting to know how closely this processes was able to approach the proposed remediation goals and the factors that prevented the process from attaining the desired goals (e.g., the current remediation level was not attempted; there were complicating technical factors, etc.).

   The last sentence of this paragraph needs clarification.

5. Section 3.0, Site Characterization Data For Soils, p. 4, second paragraph: The criteria that were used to select the four soil sampling locations (e.g., sites where maximum concentration occurs; location of the most representative suites of soils; soils very similar to those in Operable Unit 3 where Pu-contamination is also widespread; etc.) should be explained. These criteria were not developed in the FSP. To what extent the two soil types mentioned in this section represent the population of Pu-contaminated soil types at RFP should also be explained.

   It is stated that "the four sampling locations provide two types of soil to be tested." Whether each of the four locations comprises a set of two soil types should be clarified.

It is stated that "of the two soil types, each will have a high and a low concentration of Pu represented". The FSP and Attachment 1 seem to indicate that 36 random samples will be collected from the southeastern sampling location, combined into a "bulk" sample, and separated into three samples to be sent to LANL, the NTS, and RFP. The importance attached to the statement about the two soil types, each having a low and a high concentration should be clarified. If the samples are to be mixed into a bulk sample this statement seems unimportant. The goals of the sampling plan should also be clarified.

6. Section 3.0, Site Characterization Data For Soils, p. 4, third paragraph: It is stated that "soil from this location is expected to have a Pu concentration of approximately 10 pCi/g". The reason that a specific concentration is "expected" (e.g., site an appropriate reference) should be explained because the FSP indicates that concentrations at the southeast location are at approximately 500 pCi/g (Sect. 3.0, second paragraph).

   The reason that the southeast sample location was selected over the other three sample locations should be described.

7. Section 3.0, Site Characterization Data For Soils, p. 4, fourth paragraph: The reason that the magnetic separation test will be performed with soils from the southeast sample location only should be explained.

   Why additional samples will be collected from the other 3 locations for further treatability tests at the NTS is unclear. The reason future test are anticipated for the TRUclean process and not the magnetic separation process should be explained.

8. Section 3.0, Site Characterization Data For Soils, p. 5, fourth paragraph: The last sentence of the section does not appear to add any important information about the site characterization and should be deleted.

9. Section 4.2, p. 7, first sentence: The reference to Table 4-2 of the TSP is not needed since the treatment goals are already stated in this document. If the sentence is left as is, then Table 4-2 of the TSP should be included in the document.

10. Section 5.1.3, p. 10: This section only refers to reducing Pu concentrations to 0.9 pCi/g while the previous sections also mention reductions in the gross alpha and gross beta. The goals of the treatability study should be consistent throughout the document.

11. Section 5.2.1, p. 10: The end of the sentence, "for remediation alternatives," should be deleted.

12. Section 5.2.4, p. 13, second paragraph: It is stated that during the treatability tests Environmental Protection Agency analytical Level II and Level III data will be sufficient for the optimization procedure. The level of quality control (QC) appropriate for the optimization procedure should be determined and documented in the WP. The analytical

the optimization procedure. The level of quality control (QC) appropriate for the optimization procedure should be determined and documented in the WP. The analytical technique, the analytical accuracy of the technique, and the analytical precision of the technique should be known prior to the implementation of the WP. These parameters should be discussed in this paragraph.

13. Section 5.3.1, p. 14: It is stated that during the optimization process test-run soil samples from the TRUclean process will be split and analyzed both "in-house" at NTS and by an EG&G-Rocky Flats Contract Laboratory. Similar samples from the magnetic separation test will be analyzed at LANL only. Why the samples from the magnetic separation optimization tests will not be sent to an EG&G-Rocky Flats Contract Laboratory should be explained.

14. Section 6.1, p. 16, first paragraph, second sentence: The Environmental Management (EM) Standard Operation Procedure (SOP) 1.14, "Data Base Management" delineates the responsibilities and procedures that provide an orderly method by which field data will be recorded. This SOP should be listed or mentioned in the Quality Assurance Addendum (i.e., Table 1, p. 9, Quality Assurance Addendum).

15. Section 7.3.3.5, p. 33: Whether the minus 300 micron fraction of the minus 19 mm portion of the sample will be used in the moisture determination should be included.

16. Section 7.3.4, p. 34, fourth item: A statement needs to be included on why a solution of pH of 12.0 to 12.5 will be used rather than water.

17. Figure 7.3-2, p. 36: The meaning of the dotted lines is unclear. This needs to be clarified on all the figures.

    This figure shows only a block diagram of the experimental setup. This does not provide the reader with any information on what the trommel looks like. A generic schematic of the trommel should be included to provide the reader with a sketch of the equipment. This should be done for all the pieces of equipment described.

18. Section 7.3.4.1, Scale(s), p. 37, second sentence: The choice of every fifth feed sample for moisture testing needs to be justified.

19. Section 7.3.4.2, p. 37, last paragraph and all of p. 38: These should be deleted since it is not related to the section heading and has been stated earlier in the text.

20. Section 7.3.4.2, p. 39: first sentence: This sentence should be changed to read "Descriptions of the process equipment (including operating parameters) of the TRUclean Process follow:".

21. Section 7.3.4.2, p. 41, Attrition Scrubber, Feed rate, last paragraph: The basis for the selection of the 23 kilogram per 10 minutes feed rate should be described.

22. Section 7.3.5, p. 46, first paragraph: Since the process and support equipment were discussed in detail in a previous section, this section should be changed to discuss only the "Reagents" and the "Sampling/Analytical Equipment."

23. Section 7.5.2, p. 52, second paragraph: This paragraph is unclear and appears to be out of place.

24. Section 8.3.1, p. 64, last paragraph, first sentence:

    Whether the soil that is to be spiked contains Pu and how the surrogate contaminant will be blended into the soil should be explained. The Pu in the actual Rocky Flats soil will adhere to the soil particles. If the spiked soil contains Pu, the spiked material will most likely exist as separate particles that could lead to high separation factors.

25. Page 72: The volume of water used (Vorw) should be the same as those given on the preceding pages. The numbers on p. 72 have been rounded off.

26. Page 76, second bullet, third item: "Two replicates at each setting..." implies that only two runs will be conducted at each setting. A minimum of three runs is required to perform statistical analysis.

27. Section 8.6, Regulatory Requirements, p. 84: This section could be combined with Sect. 7.6 on p. 54 since both present the same information. This information could also be included as an appendix.

28. Section 1.1, Attachment 1, p. 1, last paragraph: The term bulk sample needs to be clarified. If this means that the 36 randomly collected samples will be mixed together into one sample, this should be stated.

VOLUME II

SPECIFIC COMMENTS:

1. Field Sampling Plan, Sect. 1.0, p. 3, second paragraph: The Executive Summary indicates that the Final Treatability Studies Plan (1991) identified the TRUclean and magnetic separation technologies as those most appropriate for Pu remediation at RFP. The "other potential treatments for removing Pu/americium in soil" mentioned in the second sentence should be explained. Also, whether these alternative treatment processes were screened in the FSP should be indicated.

2. Health and Safety Plan, Sect. A., p. 3, Objective: The next to last sentence states that this work is to be performed in 1991, and since this is not likely, the date needs to be corrected.

3. Health and Safety Plan, p. 4, first paragraph, fourth sentence: The term "Response Conservation" should be changed to "Resource Conservation."

   Also, the last sentence should state that the Interagency Agreement has been finalized.

4. Health and Safety Plan, Sect. C, p. 6, sixth item: "Biologic" hazards should be defined (i.e., examples given.)

5. Health and Safety Plan, Sect. D, p. 8, first sentence: Whether the 0 to 20 cm refers to the depth to which soil is sampled should be clarified.

6. Health and Safety Plan, Work Limitations, p. 10, third item: States "the soil will be wetted with distilled water to minimize the potential for resuspension prior to sampling." However, Volume I, Attachment 1, on p. 1, second paragraph, states "the soils should not be wet or muddy." This discrepancy needs to be clarified.

7. Quality Assurance Addendum, Figure 1, p. 5, title: The words "for Sampling" should be deleted from the title.

8. Quality Assurance Addendum, p. 14, first paragraph, last sentence: "Holding times are not applicable for radionuclides or physical analyses." Holding time are applicable for short half life radionuclides analyses. The sentence should be reworded to read "Holding times are not applicable for the analysis of radionuclides and physical analyses."